Fact Sheet:

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PROBECORDER: AUTOMATED FIELD RECOVERY OF SUBSURFACE TESTING DATA

The Problem

Systematic subsurface testing procedures are an increasingly necessary solution to the dual problems of discovering and assessing archaeological sites which are either deeply buried or obscured by dense vegetation. Soil scientists and geomorphologists must also rely on them for the study of regional landscape evolution and site-specific sedimentary sequences. Such procedures are extremely labor-intensive and costly since they often involve repeated, closely spaced probing by means of shovel-testing, post-holing, bucket augering, deep coring, or back-hoe trenching. In order to reduce these high costs, it is important that field data collection procedures (including probe data recording, site recording, sketch mapping, and field specimen management) be as efficient as possible. Since current recording procedures use standardized paper forms for probe data recording and gridded paper for sketch mapping, an additional data transfer step is required in post-field analysis in order to convert verbal and visual data to a digital format. Probe data must be manually entered in a computerized database and sketch maps must be manually digitized into a Computer-Aided Drafting and Design (CADD) format. These additional steps increase project costs significantly and also create the potential for human error in the data

transfer process. Therefore, development of a one-step automated system for field recording and data integration is highly desirable.

The Technology

ProbeCorder is a pen-based software tool designed to maximize the logistical efficiency of subsurface testing by automating the routine collection, integration, and storage of probe data in the field. Pen-based computers function as handheld, battery-powered, "electronic clipboards" for maximum portability and rugged outdoor use. ProbeCorder has been developed on the TelePad SL pen computer platform (TelePad Corporation) and operates within the FieldNotes "mobile GIS" (geographic information system) software environment (PenMetrics, Inc.). FieldNotes combines efficient field data recording with powerful graphic display and storage capabilities which effectively integrate GIS, global positioning system (GPS), and CADD functions.

The ProbeCorder program is written in Microsoft's Visual Basic programming language. Itcontains a series of Windows dialog boxes which are employed to record administrative and locational references, sediment profile descriptions, and artifact/feature content for each probe within a user-defined survey unit and sampling geometry. The system permits a small sketch of each sediment profile to be drawn and saved as a bitmap file; each sedimentary unit identified in the profile can then be fully described in terms of its maximum depth, texture, horizon, structure, boundary, and Munsell soil color. All field data is then stored in an internal relational database which uses Microsoft's FoxPro database format. The system has separate graphic user interfaces (GUI's) which support full Structured Query Language (SQL) querying and report-generation capabilities within the FieldNotes software environment. Where conditions permit, the system can operate as a fully functional PC by attaching a keyboard, external floppy drive, modem, and power supply for a 110/220 VAC wall outlet.

Benefits/Savings

Cost-effectiveness of the system is achieved by elimination of tedious and error-prone database entry and digitizing required by the use of paper field forms and

sketch maps. The system will provide substantial benefits to Department of Defense archaeologists and cultural resource specialists at the installation level by effectively reducing the cost of subsurface surveys and by significantly enhancing data integrity and information retrieval capabilities through fully automated field recording.

Status

The ProbeCorder program is currently being supported and distributed within the U.S. army by the Technology Demonstration and Transfer branch of the U.S. army Environmental Center (AEC), Aberdeen Proving Ground, MD. Final products include the ProbeCorder software program (on four 1.44Mb HD diskettes) ready for installation in the Windows 3.1 operating system, and an accompanying User's Manual for ProbeCorder, Version 1.0. Potential commercialization of the program is currently being explored through a Cooperative Research and Development Agreement (CRADA) with developers of pen-based software for geosciences applications.

Point of Contact

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